Pharmaceutical advertising revenue and physician organizations: how much is too much?

Peter A. Glassman
VA Greater Los Angeles Healthcare System
West Los Angeles Campus
University of California at Los Angeles
11301 Wilshire Blvd.
Los Angeles, CA 90073

Jocelyn Hunter-Hayes
VA Greater Los Angeles Healthcare System
West Los Angeles Campus
Western University of Health Sciences
Pomona, CA

Tad Nakamura
University of California
Los Angeles, CA

Correspondence to:
Dr. Glassman
Peter.Glassman@med.va.gov

ABSTRACT ● **Objective** To determine if revenue generated from pharmaceutical advertisements in medical journals creates potential financial conflicts of interest for nonprofit physician organizations that own those journals. ● **Design** Convenience sample of six professional medical societies and their respective journals. Calculation of pharmaceutical advertising revenue generated by these journals for their respective professional medical societies. ● **Methods** Random selection of each journal for one month per quarter in calendar year 1996 and tabulation per edition of the average number of pharmaceutical advertising pages for each journal. ● **Outcome measures** Published advertising rates were used to estimate pharmaceutical advertising revenue for calendar year 1996 and compared with each organization's gross revenue and membership dues and assessments, based on Internal Revenue Service documents for the last available fiscal year (1995). ● **Results** Estimated pharmaceutical advertising revenue ranged from $715,000 to $18,630,000. Five organizations raised more than 10% of their gross income (range 2% to 30%) from a single journal's pharmaceutical advertising. Four organizations raised as much or more from pharmaceutical advertising as from members (range 17% to 790%). ● **Conclusions** Potential financial conflicts of interest arising from pharmaceutical advertisements in medical journals may be substantial. The impact on professional societies' financial independence and behavior is unknown.

It is well documented that corporate contributions, usually in the form of gifts and favors, can affect clinicians' behavior.[1-8] In response to these findings, both the American Medical Association[9] and the American College of Physicians[10,11] have issued guidelines for recognizing and avoiding conflicts of interest, defined as "conditions that would cause reasonable persons (patients, colleagues, and citizens) to believe that professional judgment has been improperly influenced, whether or not it has."[12]

While guidelines on avoiding conflicts of interest exist for individual physicians, the same does not hold true for nonprofit physician organizations. On the contrary, many professional medical societies readily accept corporate contributions through continuing medical education funds, annual meeting support and fees, and academic and research grants.[11,13-16] While such funding clearly helps the underlying fiscal health of physician organizations, it also creates the same ethical conundrum for organizations as it does for individual physicians.[17,18]

A potential conflict also occurs because of pharmaceutical advertisements in medical journals. Such advertising helps to offset publishing costs but may also provide substantial operating funds for parent organizations,[19] thus creating potential conflicts of interest between professional medical societies and the pharmaceutical industry. While debate about pharmaceutical advertising has focused on its anecdotal value[19-24] or informational content,[25-30] little is known about the larger issue of potential conflicts of interest arising from the generated revenue. This study attempts to address this issue by estimating annual pharmaceutical advertising revenues for selected nonprofit physician organizations.

METHODS

Physician organizations and journal selection

We evaluated a convenience sample of six nonprofit physician organizations. Each organization owned and published at least one peer-reviewed journal that was of interest to internal medicine practitioners (generalists or specialists) and that allowed pharmaceutical advertising. The organizations were (in alphabetical order) American College of Cardiology, American College of Physicians, American Medical Association, American Thoracic Society (the medical section of the American Lung Association), Infectious Disease Society of America, and the Massachusetts Medical Society.

For each organization, we evaluated one primary clinical journal. The journals, listed in order of the organizations above, were Journal of the American College of Cardiology, Annals of Internal Medicine, Journal of the American Medical Association (JAMA), American Journal of Respiratory and Critical Care Medicine, Clinical Infectious Diseases, and The New England Journal of Medicine (NEJM).

Quantifying pharmaceutical advertising

To account for monthly variations in advertising budgets, we randomly selected 4 months (January, June, July, and November) in calendar year 1996 to evaluate pharmaceutical advertising. All journal editions published during those months were included. We did not evaluate supplements or newsletters.

We defined pharmaceutical advertisements as those advertisements for diagnostic or therapeutic, prescription or over-the-counter medications. Vaccines and non-pharmaceutical advertisements, such as those detailing devices and medical/surgical supplies, were not included. For each journal edition in the months selected, we tabulated the number of pharmaceutical advertisements, as defined above, and the total number of pages for those advertisements. Individual pages were then classified as primarily black & white or color. The average numbers of pharmaceutical advertisements and of advertising pages (black & white and color) for those medications were then estimated per edition.

For Annals of Internal Medicine, Journal of the American College of Cardiology, American Journal of Respiratory and Critical Care Medicine, and Clinical Infectious Diseases, the advertising in library editions was similar to editions received by practicing physicians. For these journals, our study used publications from the West Los Angeles Veterans Affairs (VA) Medical Center's medical library.

Two journals, NEJM and JAMA, produced multiple editions of their journals (same text but different pharmaceutical advertisements), with editions usually varying by geographic region and physician specialty. We were informed by publishing staffs that primary care physicians received editions with the most advertisements and libraries with the fewest advertisements. For these journals, we calculated the average number of pharmaceutical advertisements and of pharmaceutical advertising pages from the library edition (i.e., containing the lowest number of advertisements) and from a local (Los Angeles) primary care edition (i.e., containing the greatest number of advertisements). One primary care edition of the NEJM (4 January 1996) could not be procured. Therefore, to estimate the number of primary care pharmaceutical advertisements and advertising pages for that one issue, we used a multiplier based on the average difference in advertising between the library and the primary care versions.

Pharmaceutical advertising revenue

To calculate advertising revenue per edition, we used the published advertising rates for full-page black & white and color advertisements, then multiplied these by the average number of black & white and color advertisements per edition, as determined above. All advertising rates were obtained from the publisher in mid 1997.

Because we did not have access to publishers' commercial practices, we used assumptions designed to understate revenue. First, we rounded down the number of advertising pages to the nearest whole page. Second, pages with nominal color were categorized as black & and white, the least expensive classification. Third, we used the most common, and usually the mid-range cost, for color printing, known as "3- or 4-color process." Fourth, we used the earned discount rate (the discount for frequent advertising) for half the number of journal issues per year. So, if a journal put out 12 editions a year, we used the discount rate for 6 months of advertising. Fifth, advertising rates in special positions (inside front cover and inside back cover, for example) were calculated using the same rates as other pages. Sixth, to account for inflation from 1996 to 1997, we applied a 5% discount rate to advertising revenue.

Annual revenue was calculated by multiplying average advertising revenue per edition by the number of editions published per year. Revenues were adjusted for JAMA and NEJM by averaging the estimated revenue derived from primary care editions (with the highest number of advertisements) and library editions (with the base number of advertisements).

Conflict-of-interest measures

We focused on relative, rather than absolute, measures of financial support to better describe the proportional income effect on organizations, as had been suggested in previous literature.[12] We compared advertising revenue relative to an organization's total income to assess the level of financial risk faced by an organization, should that income be lost.[12] To compare advertising income to a primary internal revenue source, we compared pharmaceutical advertising revenue with an organization's membership dues and assessments.

To standardize organizational revenues, for each organization we used publicly available Department of Treasury Internal Revenue Service (IRS) Form 990, Return of Organization Exempt from Income Tax, for the last available fiscal year (1995). These documents were requested under Internal Revenue Code 6104 (IRC-6104). Organizations' fiscal years generally began and ended at midyear, although this was not always the case. Total revenue and membership dues and assessments were taken directly from line 12 and line 3, respectively, in Part I of Form 990.

RESULTS

The average number (standard deviation) of pharmaceutical advertisements per issue in the selected journals ranged from an average of 9.25 (4.4) in Clinical Infectious Diseases to 27.4 (5.4) in JAMA (primary care version) (see Table 1). The total number of pages of pharmaceutical advertisements was lowest in American Journal of

Table 1 *Pharmaceutical advertising in selected journals*

Organization	ACC	ACP	AMA	ATS	IDSA	MMS
Journal	JACC	Annals	JAMA*	AJRCCM	CID	NEJM
Number of pharmaceutical advertisements per issue: average (SD)†	20.75 (5.0)	19.0 (4.6)	27.4 (5.4)	11.5 (3.5)	9.25 (4.4)	21.875 (2.6)
Total pages of pharmaceutical advertising per issue: average (SD)	99.0 (18.4)	61.5 (13.2)	71.7 (16.4)	27.25 (12.0)	27.5 (11.5)	60.6 (9.4)
Text pages per issue: average (SD)	294.25 (42.1)	81.25 (5.6)	78.7 (7.7)	353.5 (90.6)	232.5 (24.1)	70.9 (7.6)
Ratio of pharmaceutical advertising pages to text pages	0.34	0.76	0.91	0.08	0.12	0.85
Estimated revenue from pharmaceutical advertising per issue	$359,420	$250,123	$372,572	$59,790	$59,614	$275,211
Estimated gross revenue from pharmaceutical advertising (millions/year)	$4.67	$6.00	$18.63	$0.717	$0.715	$14.31
Pharmaceutical advertising revenue as a proportion of total revenue (%)	13.8	12.9	10.4	2.1	31.3	21.3
Pharmaceutical advertising revenue as a proportion of membership dues and assessments (%)	93.0	133.9	26.2	17.1	125.4	792.7

ACC = American College of Cardiology (JACC = Journal of the American College of Cardiology); ACP = American College of Physicians (Annals = Annals of Internal Medicine); AMA = American Medical Association (JAMA = Journal of the American Medical Association); ATS = American Thoracic Society (AJRCCM = American Journal of Respiratory and Critical Care Medicine); IDSA = Infectious Disease Society of America (CID = Clinical Infectious Diseases); MMS = Massachusetts Medical Society (NEJM = The New England Journal of Medicine).
*Data presented for JAMA and NEJM are based on primary care edition except for advertising revenues, which were calculated from the average of primary care and library editions (see text for details).
†SD = standard deviation.

Respiratory and Critical Care Medicine (27.25 [12.0]) and highest in Journal of the American College of Cardiology (99 [18.4]) (Table 1). The proportion of black & white pages to color pages ranged from approximately 63% to 79% (data not shown). The ratio of pharmaceutical advertising pages to text pages (Table 1), which included editorials, book reviews, and letters, was lowest for the American Journal of Respiratory and Critical Care Medicine (0.8) and Clinical Infectious Diseases (11.12) and highest for the primary care versions of JAMA (0.91) and NEJM (0.85). The primary care version of JAMA contained about three times more advertisements than the library copy, whereas the primary care version of NEJM contained slightly less than 1 1/3 more (data not shown).

Our estimates indicated that pharmaceutical advertising raised nearly $46 million in calendar year 1996 for the six selected journals. There was a wide range of advertising revenues ($715,000 to $18,630,000), but these did not necessarily correspond to proportional measures of financial support (Table 1). For example, pharmaceutical advertising revenue from Clinical Infectious Diseases was fairly small (about $715,000) but represented nearly 30% of the gross revenue for the Infectious Disease Society of America. On the other hand, with nearly the same total ($717,000), the American Thoracic Society had the lowest proportional support at approximately 2% of total revenue. Overall, five of the six organizations raised 10% or more of their total annual revenue from a single journal's advertising (Table 1).

Four organizations generated as much or nearly as much revenue from pharmaceutical advertisements as from membership dues and other assessments. For example, advertising revenue from NEJM brought in almost eight times more money than did member contributions to the Massachusetts Medical Society. Conversely, the advertising revenue for the American Thoracic Society amounted to less than a fifth of membership dues and assessments (Table 1).

DISCUSSION

Our estimates suggest that nonprofit physician organizations may have substantial potential conflicts of interest due to pharmaceutical advertising revenues, even from a single journal. As Blumenthal pointed out, conflicts of interest are conditions, not behaviors,[31] so our results should not imply that pharmaceutical firms have influence over physician organizations (or their journals) due to advertising. Further, the data for each organization was

generated from a single journal, not from all publications. There were disparities among organizations and journals as well. For example, the Massachusetts Medical Society is a relatively small medical society, but NEJM has an international audience; we would expect it to have a greater disproportion between membership dues and pharmaceutical advertising revenue than other professional societies.

Some may argue that the potential conflict of interest is only at the level of the journal and that editorial independence eliminates it.[19] Another argument is that profits are small because the advertising income is used to support editorial staff and publishing costs. These arguments are not accurate, however, because a journal is ultimately the responsibility of its parent organization, as was shown by recent events at JAMA,[32] and because advertising revenue allows organizations to shift other revenue streams (membership dues and assessments and various user fees, for example) to alternative purposes or to enhance gross income. For example, five of the six organizations examined had surpluses in fiscal year 1995.

The concerns that individual physicians will alter prescribing behavior because of interactions with or gifts from pharmaceutical representatives is not applicable to professional medical societies.[1-6,8,10,11] Nonetheless, the money from advertising helps support organizations in their public and educational missions and in their membership advocacy. As Ubel and colleagues pointed out, since nonprofit organizations can become dependent on financial support, an organization may become reliant on external funds, compromising itself to attract or maintain desired revenue levels.[18]

The likelihood of dependency increases as the proportion of income from a single source increases relative to gross income.[18] Similar to individuals, an organization under considerable financial risk is more likely to have, or to be perceived as having, a serious potential conflict of interest. For individuals, the Health Care Financing Administration defines "substantial financial risk" as a potential withholding (e.g., possible gain or loss) of more than 25% of expected earnings.[33] By our estimates, only one physician organization reached that level of financial risk from pharmaceutical advertising with a single journal, but our study could not include revenue derived from all financial interactions with the pharmaceutical industry. Yet even if the sum were less than 25%, we would be concerned because it is unclear what threshold of financial risk qualifies as a conflict of interest for a nonprofit organization.[34]

On the other hand, it is unlikely that any single corporation buys enough advertising space to cause an organization to become dependent. This lessens the likelihood that any one corporation could influence a physician organization by threatening to withhold advertising. Nonetheless, as Pritchard pointed out in discussing institutional relations with industry, the cumulative effects of numerous small revenue streams should not be discounted.[34] Moreover, individual pharmaceutical firms have been known to take action against researchers when it is in the firms' best interest.[35] Further, collective corporate action is possible, as suggested by at least one commentator[30] discussing the downturn in pharmaceutical advertising in Annals of Internal Medicine[36] following publication of the 1992 article critical of drug advertisements by Wilkes and colleagues.[28]

Outside revenue can also compromise an organization by creating a sense of obligation to the revenue sources.[18] For several organizations, the money generated from a single journal's pharmaceutical advertising provided financial support equal to or greater than that brought in by members themselves. Consequences of such undue influence could include allowing advertisers greater access to physicians at annual meetings or having a high-ranking member lobby on behalf of advertisers.

Finally, potential financial conflicts of interest can damage an organization's credibility with both the public and policymakers.[37] Moreover, the damage to credibility can interfere with an organization's ability to act as a role model.[18] For example, we believe that any message admonishing physicians to avoid gifts and favors from the pharmaceutical industry appears contradictory when physician organizations benefit extensively from the same source.

It is important to discuss the limitations of this study. Because publishing staff uniformly rebuffed our queries about business matters, we felt it best to provide low-end estimates of drug advertising revenues. Still, our discounts may have been too small or too large. For example, in the case of JAMA, using 1 year instead of 6 months for the earned discount rate would have reduced revenues by about 2% overall. Using a less expensive printing process (i.e., 2-color process) to calculate revenues would have reduced advertising income by 15%, but most color advertisements appeared to use 3- or 4-color process. The year we chose to assess advertising may not be representative of other years. Some organizations do not own journals, and some journals are not wholly owned by organizations or are owned solely by private publishers.

The purpose of our study was not to censure organizations but to quantify potential conflicts of interest for nonprofit physician societies that generate revenue from corporate sources. We believe that it is important for medical societies to recognize that pharmaceutical advertising revenue can strongly affect their financial health. To minimize any adverse perceptions or effects associated with these potential financial conflicts of interest, we encourage nonprofit physician organizations to openly

disclose gross advertising revenue accruing from pharmaceutical advertising and, for that matter, gross revenue accruing from all financial interactions with the pharmaceutical industry.

Finally, in the absence of guidelines, we strongly encourage nonprofit physician organizations to consult annually with their members to decide democratically what threshold of subsidy is acceptable. As a guiding principle, and to echo the American College of Physicians, professional societies and their members should ask themselves, "What would the public or [our] patients think of this arrangement?"[11]

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COMMENTARY

Don't bite the hand that feeds you

Joel Lexchin
Emergency Department
The Toronto Hospital
Department of Family and Community Medicine
University of Toronto
Toronto, Ontario
Canada

Correspondence to:
joel.lexchin@utoronto.ca

"Don't bite the hand that feeds you" is a line from a 1971 song by a Canadian folk group, Humphrey and the Dumptrucks. And it is the issue posed by this article. Are medical organizations willing, if necessary, to bite the pharmaceutical industry hand that feeds them? Circumstantial evidence suggests that they may not be. Why did the American Medical Association (AMA) wait until a week before the Senate Labor and Human Resources Committee hearings on the promotional excesses of the pharmaceutical industry before they adopted ethical guidelines about travel expenses and gifts?[1] Was it the prospect of being embarrassed by their own previous inaction that prompted the AMA to act?

During the mid 1980s, the Canadian government commissioned an inquiry into whether compulsory licensing